EXPLORATIONS

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COLOR, TV AND ALL THAT

It is interesting how revealing words can be. How often have you heard someone remark that "the Globe says . . ." or that they "watched it on television . . ."? The way we speak about media reveals something about the media; so it is not at all surprising that persons are already — perhaps a bit boastfully — remarking that, "I saw it in color . . . ," rather than, "I watched it on color television." When color is added you get depth and involvement and you **do** see it.

The point here is that color television is not television: it is color. It is a new, different, totally absorbing medium. Edmund Carpenter once wrote in *Explorations* about the new languages of radio, TV and film.[1] Now we must add another new language: color.

This idea, that color is a new medium, is fascinating in its complexity for it opens up an uncharted world for imagination and speculation. If television, still so new, has changed society, what then will even newer color do?

The subject is of special interest to the journalist for Marshall McLuhan's basic premise that the media are all different and that they shape the message has already obliterated the concept of fair, accurate and objective reporting. Professor McLuhan's conclusions put the journalist in the position of transmitting a message he cannot control. A vivid example comes from television where certain studio slipups can create effects on the home screen that can not be caught on the studio monitors. Given this, the journalist is already struggling

[1] Carpenter, Edmund, "The New Languages" in Edmund Carpenter & Marshall McLuhan, ed., *Explorations In Communication* (Boston: Beacon Press, 1960), pp. 162–179.

with the present media — radio, the newspapers, television: now he is faced with adjustment to color.

It would be pleasant to be able to provide a layman's guide to color as a practical tool for journalists, but it is impossible. The quest has only started. The first sip from the grail however is very heady wine indeed and there is some material which may provide leads if not answers. Perhaps they will stimulate someone else's thoughts.

This article discusses the results of four experiments related to color and/or television. The initial experiment has already been published in abridged form in Canada[2] and is being published this summer in the United States.[3] Only the conclusions are reported here. The second experiment has been published[4] but the conclusions drawn here are totally different. The other two experiments have not been published. All four merely open a few doors to the world of color TV.

Ralph Evans wrote in his book, *An Introduction To Color*, that "color is what you *do* see, not what you should see."[5] Color can be hot or cold or emotional. Color creates depth on a flat surface. The lore of color must now be rethought for television.

Before presenting color as a new language, it is essential to emphasize what Professor McLuhan has been saying. If you watch an event in person, hear about it on the radio, hear about it by someone else either in person or by telephone, read about it in the newspaper or see it on television, you are, in each case, dealing with a separate event. The media does not simply alter the message: it is the message. There is experimental support for this idea.

In one experiment, the Langs compared reports of persons actually present at MacArthur day in Chicago, when the U.S. general returned from Korea, with reports from persons who had seen the event on television.[6] The impact of the event was quite different on television. The crowds were more curious, less pro-MacArthur than the television made one believe. In another experiment, the Langs selected a group of equally biased individuals to watch a Democratic political convention on television.[7] The groups watched the same picture — because the various networks were sharing camera coverage — but the commentators were different. The change of comment alone changed the event and changed the reaction of individuals to the event. The spoken word altered the picture that they saw.

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[2] Scanlon, Joseph, "Color Television: A New Language", in *Take One*, Volume 1 No. 4, April, 1967, p. 15.

[3] The full report of the experiment is to appear in the summer, 1967, edition of *Journalism Quarterly*.

[4] "How Color Beefs Up TV Ad Impact", in *Broadcasting*, Vol. 58 No. 20, May 16, 1960, p. 3.

[5] Evans, Ralph M. *An Introduction to Color* (New York: John Wiley & Sons, Inc., 1959), p. 185.

[6] Lang, Kurt & Lang, Gladys Engel, "The Unique Perspective of Television and Its Effect: A Pilot Study", in *American Sociological Review*, Vol. 18 (1953), pp. 3–12.

It is a shame that more, similar experiments have not been tried with other media. Professor McLuhan has suggested that Carleton's School of Journalism attempt to investigate the telephone as a medium of communication. For example, what happens to the printed report of an event that is dictated by a reporter to a rewrite man by telephone compared to one written by the reporter in the office? What happens to a man when he prepares copy for radio or television rather than for a newspaper? Does he prepare differently and, if so, how differently? The area is most fertile for study.

Individuals react differently, too. No two individuals can observe an event precisely the same way. Since each individual relates what he sees or hears or feels to his own experience and attitudes, he sees or hears or experiences something different from everyone else. A simple example comes to mind.

Recently, CBC television carried an hour-long special on the Tijuana Brass, the popular musical group with their string-brass sound. I *listened* to the music watching Herb Alpert, his fingers, his technique because I play the trumpet myself.[8] A friend also *listened* (despite the fact the picture was there) because he liked the music. Another friend, a television professional, saw the production. She watched it for editing, staging, direction, etc. She said the show was excellent. Anyone who has ever worked in television news is familiar with the tape that is used as a cue out three seconds before the end of a filmed news clip. To the pro, the tape seems to crawl across the screen like a giant asphalt highway: the non-pro finds it very hard to see the tape even if he is warned that it is coming. If you do not understand this reference try spotting end cue marks on your screen when you watch a newscast: they are there. A fourth friend watched Tijuana Brass in color, the way it was meant to be seen. To him the staging was fantastic as the moving color portrayed the musical intent. (To me the forms were distracting.) He saw a different show. This is casual observation, perhaps, but it is a useful stimulus for experimental research.

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[7] Lang, Gladys Engel & Lang, Kurt, "The Inferential Structure of Political Communications: A Study In Unwitting Bias", in *Public Opinion Quarterly*, Vol. 19 (1955), pp. 166–184.

[8] It is probably not unfair to report in a supplement to *Varsity Graduate* two years of marching and oom-paahing in the Blue & White band.

A more serious test of color and black and white television was made with the help of CBC, Ottawa, on March 8, 1967, the day of the funeral of the late governor-general, Georges Vanier. The Vanier funeral was broadcast live and in color. Carleton Journalism students could have attended: instead 21 of them — all in the graduate year — watched the funeral coverage on television.

Although CBC has now separated its radio and television hockey broadcasts it has not learned that color is a new medium so the funeral was telecast with same picture, same voice over both color and black and white receivers. The 21 students were divided at random and split into color and black and white groups. They were told in advance that they would have to write a report of the funeral[9] and that they could add any comments they chose. What they heard was the same; what they saw was purportedly the same — except for the addition of color. The reports, far from being the same, were totally different.

The color group made more color references, perhaps the one completely probable outcome. But the color group also became far more emotional and wrote as participants rather than reporters. One student said, "the golden glow of the Basilica gave me the feeling I was there". Another described the funeral as "personal and awesome". Color added depth and life and absorption.

While the color group became involved, the black and white group took notes. The black and white students wrote far longer, far more detailed reports. An editor, checking on his reporters, would have faulted those in the color group for the thinness of their reports. A list was made of 10 key details (all mentioned by the commentators and seen on camera): editors would have expected all these details in well-done stories but the chances were two-to-one that a student who had included more than an average number of details was in the black and white group.

The initial discussions about this experiment produced a predictable result: it was faulted on the grounds that color television was a novelty. The novelty effect disturbed the results: reporters introduced to color were like children with a new toy. This possibility can not be rejected although two of the color group had been exposed regularly to color television for a year prior to the experiment and only one was a color virgin, so to speak. However, one further difference was so complete to suggest that the novelty effect is hardly sufficient explanation: perhaps novelty sharpens differences in degree and aids in their identification.[10]

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[9] The use of reports as a research tool avoids pre-judgements by the experimenter affecting the results. Journalism students are trained to write reports in a standard format. Deviations are therefore fairly readily identified.

The fourth difference was the sharpest of all and is best shown by a chart: the black and white group were far more aware of the commentators, the spoken word, and showed a pronounced irritation at many of their comments. This irritation was non-existent among the color group members.

	B & W	COLOR
References to Commentators	111	9
References by Name	67	1
Critical References	45	3

These differences are incredible. Color lectures on educational television could be experiments in futility.

The possibility of the discount of the spoken word was anticipated. The commentators were two well-known television journalists, Norman DePoe and Stanley Burke,[11] and they were heard, but never seen or named, throughout the broadcast. In a post-report questionnaire, the students were asked to identify the commentator inside the church (Burke). Color group members — though they were given a list of names to choose from — simply could not recall. They persisted in adding new names to the list.

Other experiments suggest other things about color. The individual's own conditioning affects his expectations and his reaction to color. Color is also different than black and white because in all probability it has a different impact on females than it does on males.

Another experiment conducted at Carleton, this time with students in the second year of the undergraduate program in Journalism, suggests that individuals have expectations tied to color and black and white. In this experiment, two random groups, 15 to 18 in each, were told they were to see a film. One group was told the film would be in color, the other group that it would be black and white. It is hardly surprising that three students, two in one group, one in the other, wrote that they expected to see a film about Journalism. The other results were surprising.

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[10] An intriguing support for this position came from an instructor at the Eastern Ontario Institute of Technology. The color-black and white hypothesis was mentioned to him. He replied, "I agree. I saw the Vanier funeral first on my own color set, later on black and white. It was not the same funeral." He was not aware of the Carleton experiment.

[11] Mr. Burke's position as anchor man on CBC late evening news had been a subject for discussion at the School of Journalism. Mr. DePoe was a former seminar leader at Carleton.

The reference to Journalism was the only overlapping reference. The black and white group expected content, perhaps a documentary. Two students expected an art film. Two suggested a foreign film, one from Europe. Three thought of an old movie. Six color students expected scenery. Two thought of comedy. Although color was the only operative word, one student said he expected to be disappointed. Another student summed up the general impression: color, she said, would probably mean "light comedy rather than deep and symbolic and of social significance". If the words "color" and "black and white" trigger such divergent responses, it is hardly surprising that color and black and white television produce such diverse results.

The most intriguing side of color, however, is the sexual side. Some years ago a U.S. firm did an experiment which purported to show that color enjoyed a three and one-half to one superiority over black and white television as a commercial medium. The results were calculated by assigning scores to answers to a questionnaire. In the chart below, the original test scores have been used to recalculate the percentage increase in the score when color rather than black and white is used. They might be called comparative effectiveness scores. In other words, the figure "41" means that the scores on the test questionnaire were 41 per cent higher for those who watched Perry Como in color over those who saw him in black and white. (The color and black and white groups were supposed to be matched groups: whether they were or not is not important to the discussion here.)

Percentage Increase Color/Black and White	PERRY COMO	DINAH SHORE	HALLMARK
Commercial Recall	41	25	40
Persuasiveness	75	25	80
Recall of Commercial Detail	75	25	71

Viewed this way, the figures suggest that Dinah Shore gained far less by the addition of color than did her rivals.

The original study had not done this kind of a comparison but it did suggest an explanation. In the surveying on the Dinah Shore show, "men as well as women were interviewed. . . ."[12] Presumably the surveyors expected the addition of men would give Miss Shore a boost. Instead, the experiment seems to have produced the opposite effect. Color had more of an impact on women than men. From childhood, women are more color conscious in our society.

Psychologists say that women dream in color and men in black and white. A check on this using a large sample of Ottawa schoolchildren found statistical support for the hypothesis that females are more likely to say they dream in color. This experiment was significant enough to justify another trial using more rigid controls and, when it is finished, more rigid analysis of the data. The initial problems resulted from the fact that many children replied, "both", and because isolating this group gave the significant results. Now we want to know what children mean when they say, "both".

At present, a Carleton researcher is doing a systematic review of the literature with regard to television and color. Hopefully, interviews will be conducted with film makers and photographers, with television producers and advertisers and with others who have a say in the use or non-use of color. Photographers seem to prefer black and white; but artists do not. Why not? Do film makers deliberately choose black and white because they know the image they want and the audience they want to attract? Are food makers ruining their reputations by distorted color commercials on television? Will hockey gain or lose viewers as it goes to color? What about other sports?

If all this suggests anything it suggests that we know all too little about media and the way we use them and the way they affect us. Yet media can change society. Color could change our attitudes about politicians and government and society. It could change our government. It could alter male-female differences if it permeates our males. We know so little we can dream very wildly indeed. Admittedly, some of these statements sound inane or outrageous. Sometimes it is necessary to be provocative to stimulate thought. However, it is also true that in the world of media we know so little and we have tested so little that the wildest concept may be far from fantasy. Suppose someone had forecast that a radio drama of an invasion from Mars could cause a panic? The effects of media are mysterious and unchartered.

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[12] "How Color Beefs Up TV Ad Impact", in *Broadcasting*, Vol. 58 No. 20, May 16, 1960), p. 3.

If the journalist is to get across to his audience what he wants to get across perhaps he will have to be taught to report in a way that takes into account the fact that the media shapes the message. Color complicates this. The only thin ray of hope for a temporary breathing spell is that color sales are slow.

T. Joseph Scanlon, Associate Professor and Director School of Journalism, Carleton University.

SPACE IN PHYSICS AND COSMOLOGY*

Not isolated, but interacting, spaces and fields.

The nature of "space" has been variously interpreted as: the "order" or the "positional quality", the "container" of, or that "contained" by, material objects; the "independent cause" of the inertia of bodies acting upon, but not acted on; a "continuum" or a "field"; an empty "void"; or an abstract sum total of "places". The Atomists laid emphasis on the physical character of space, the Platonists stressed its abstract geometrical and mathematical aspects, while the Aristotelians propounded its ontology. Max Jammer[1] has admirably sum-

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*This article is an appendix to the author's "Predicting Scientific Prediction" which appeared in the previous issue of *Explorations* (Spring, 1967).

[1] Max Jammer, *Concepts of Space* (Cambridge, Mass.: Harvard University Press, 1957).

marized these views, but the founder of modern mathematical field theory, J. Clark Maxwell, declares:

> We cannot describe the time of an event except by reference to some other event, or the place of a body except by reference to some other body.[2]

Physical spaces or fields are both created and measured by interacting physical processes. How can we best represent such spaces for both "explanation" and "exploration" in our present scientific and social context?

Neither mechanical, nor mathematical, but physical models.

Nineteenth-century physicists sought to explain electromagnetic phenomena in terms of visually conceivable behaviour of invisible "ethers" (aethers) obeying the laws of Newtonian mechanics. However, twentieth-century physicists found that the movement of "ponderable matter" *through* an "imponderable ether" eluded detection by any experiment they could devise. After accepting the mathematical consequences of Einstein's relativity postulates, most scientists abandoned the ether as a "meaningless" fiction. Nevertheless, Einstein himself insists:

> According to the general theory of relativity space is endowed with physical qualities; in this same sense, therefore, an ether exists. In accordance with the general theory of relativity space without an ether is inconceivable. For such a space there would not only be no propagation of light, but no possibility of the existence of scales and clocks, and therefore no spatio-temporal distances in the physical sense. But this ether must not be thought of as endowed with properties characteristic of ponderable media, as composed of particles the motion of which can be followed; nor may the concept of (mechanical) motion be applied to it.[3]

However, Einstein's mathematical representations, like all mathematical theories, are prisoners of their own logical structure, of Yes-OR-No thinking — the paradigm of rationality. Today's "crisis in physics" therefore demands new physical models, that subserve neither mathematics nor mechanics, to make the invisible physical environment more "visible", without ignoring its non-visual aspects.

[2] J. Clark Maxwell, *Matter and Motion* (New York: Dover Publications, n.d.), p. 12.
[3] Albert Einstein, *Essays in Science* (New York: Philosophical Library, 1934), p. 111.

Both full vacua and empty plena.

The opposite of a *plenum* of something physical, is its absence or its *vacuum.* (See Figure 1, page .) We thus avoid confusing the relative vacua of physics — "empty space" — with the abstract *void* of philosophy, an absolute emptiness, where nothing can happen. The "fields" or vacua of higher levels resolve themselves into the "particles" of successively lower levels of *apeiron*[4] organization. By thus broadening the vacuum concept, we can express not only the absence of *matter*, but also the absence of *ether*, and that of other kinds of particles, relative to their own specific levels. A vacuum of matter then refers to the absence of matter particles, but does not preclude a field, or a space, or an idealized plenum of ether particles that, upon descending the physical scale of magnitudes, resolves itself into still other particles which may again, by their absence, constitute a vacuum.

Both limited, and unlimited, macro- and micro-universes.

Reaching beyond the galactic portrayals of today's cosmologists[5] Figure 1 suggests possibilities of open, interpenetrating, rather than closed, or separate, physical universes. It also implies that every individual observer would become the centre of his own particular universe, whose boundaries would depend not merely upon the limits of electro-magnetic wave propagation but would also allow for other known, and as yet unknown, means of "communication". Moreover, it hints that electro-magnetic radiation from distant galaxies would be reduced not only in amplitude, through *outward* distribution ("spherically"), but also in frequency, through *inward* diffusion ("red-shift").

In addition, the model leads us to expect definite thresholds of velocity and amplitude in process activity at each level — *energy* analagous to particle motion — minima and maxima necessary to maintain relatively stable forms of organization. We may also anticipate diffusion of "energy" both "inward" and "outward", upward and downward, in Figure 1. Physical pulsations, movements, changes may tend to reinforce or cancel each other within the same or between different levels. When this occurs in a relatively closed system, we have transfers of "energy" through positive (self-amplifying) and negative (self-attenuating) feedback with their corresponding thresholds of instability. Of particular interest are thresholds and "triggers" involving perceptible changes of physical state, chain-reactions, trend reversals, and major transformations of "energy" from one level to some other in the physical hierarchy (such as Heisenberg's electro-magnetic energy quanta, Hubble's cosmic red-shift, Joule's mechanical equivalent of heat, and Einstein's mass-energy conversion) also from the physical to the biological, psychological, and social domains.

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[4] Anaximander's *apeiron*, postulated in a narrower sense, as the ultimate physical base for all physical phenomena. See Charles H. Kahn, *Anaximander and the Origins of Greek Cosmology* (New York: Colombia University Press, 1960), p. 199.

[5] Jagjit Singh, *Great Ideas and Theories of Modern Cosmology* (New York: Dover Publications, 1961).

Interfacing spaces in both sciences and arts.

Such a hierarchy does not presume a replication of universes within universes, differing in magnitude only; but it does suggest the "evolving" and "devolving" potentialities of essentially different, interrelated forms of physical organization — both infra-electronic and supra-cosmological — each with its own distinctive "laws" and characteristics, resulting from endless interaction, and growth or decay. Their "characteristics", "traits", or "properties" *are* their interplay. Particles as processes are *not contained* in abstract space but *continually create* their own multi-level physical spaces, which are *both continuous* in their discontinuity *and discontinuous* in their continuity. We may represent some aspects of these physical spaces by three-dimensional Euclidean geometry, by infinite Riemannian manifolds, by Einstein's space-time tensor equations, by both "visual" and "acoustic" models[6] as seemingly most appropriate for "explanation", or for "exploration", but never completely.

For the spaces of the "scientist" do not exist in isolation. They are in constant interplay with the "spaces" of the "artist", and of people who claim no tie to either art or science. They are continually interfacing with an infinitude of spaces[7] created by other than "purely physical" processes, determined by the prevailing sensory biases and cultural environments of actual perceivers.

Barrington Nevitt, Consulting Engineer.

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[6] Milič Čapek, *Philosophical Impact of Contemporary Physics* (New York: Van Nostrand, 1964), p. 399.

[7] Edmund Carpenter and Marshall McLuhan, "Acoustic Space", in their *Explorations in Communication* (Boston, Mass.: Beacon Press, 1960), pp. 65–70.

NOTES TO FIGURE 1

1 Mean free paths of some qualitatively distinctive and speculatively imagined physical particles, described in terms of terrestrial units, indicating the relativity of physical vacua.

2 Smaller particles at lower levels of organization may constitute the physical spaces — the fields — for larger particles at higher levels.

3 Scales of magnitude lose significance at the extremes — maxima and minima — of physical organization, since comparisons are no longer possible.

4 Events at the terrestrial mechanical level are measurable in terms of mass space, and time units referred to physical processes at this level. Events at other levels in the hierarchy, although "governed" by their own "laws", are normally referred to the mechanical level by interpolation and extrapolation.

5 Limits of resolution for events at each level depend upon the ultimately particulate nature of the physical processes available as reference standards. Although the lowest resolvable level may serve as a standard for all others, the validity of interpolating and extrapolating mass-space-time units, and "laws" derived from one level to another, requires determination of where "discontinuity" supersedes "continuity", and what conceivable transfers and transformations are actually possible.

Physical Particles and their Vacua

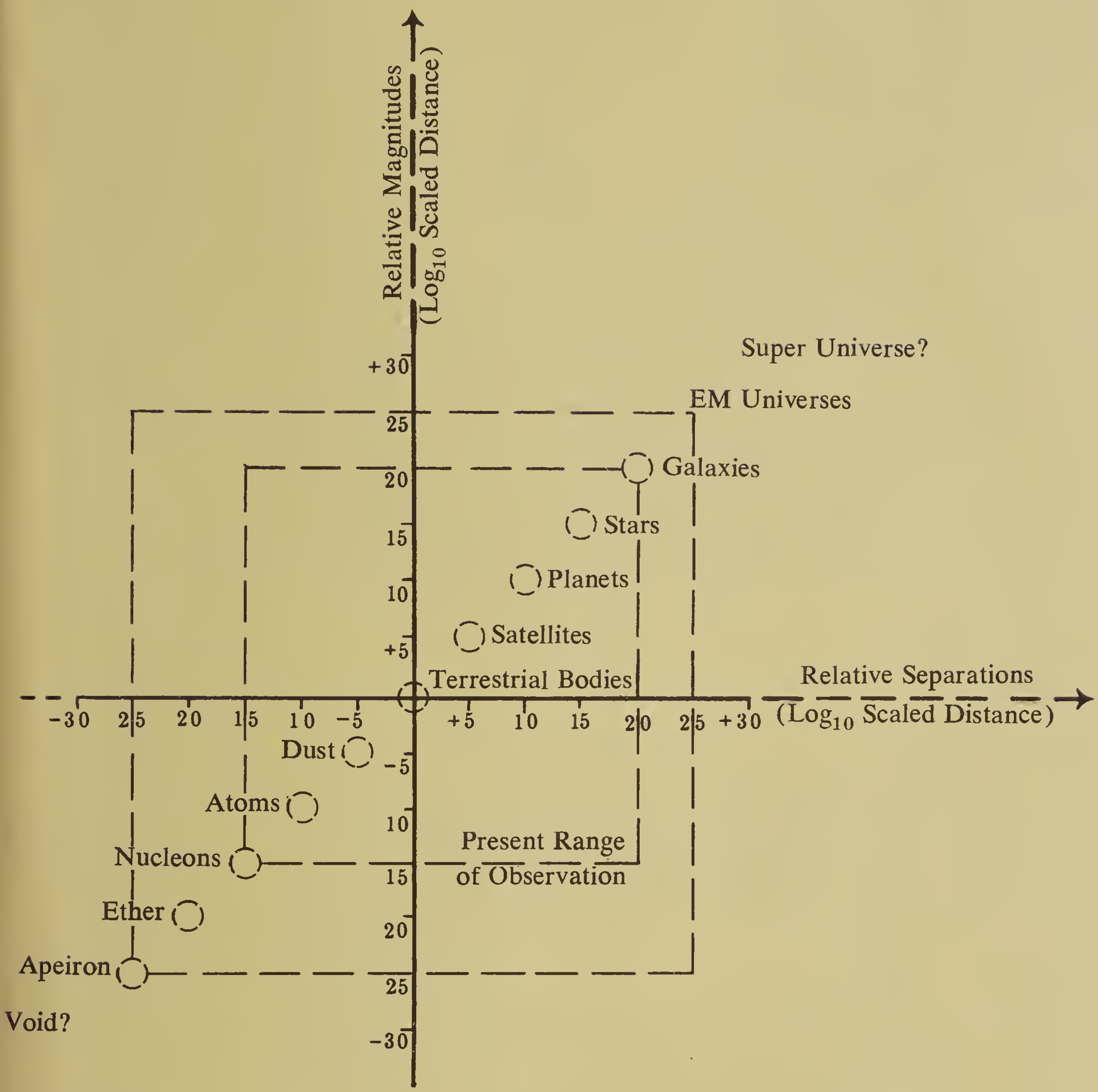

Figure 1